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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

ELECTROMAGNETIC SURVEY OF DELL MINERAL CLAIMS 10, 13, 14, 15,  
16 FR, 17 FR, 18, 19 FR, 20 and 23 - OMINECA MINING DIVISION

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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED  
GEOLOGICAL DIVISION

ELECTROMAGNETIC SURVEY OF DELL MINERAL CLAIMS ADJACENT TO THE  
SWANNELL GROUP, INGENIKA AREA - OMINECA MINING DIVISION

GENERAL

This report and accompanying maps are submitted for the purpose of recording as assessment work the direct field expenditures entailed in conducting a McPhar E.M. survey. Applications for certificates of work will be submitted for each of Dell Mineral Claims Nos. 10, 13, 14, 15, 16 Fr, 17 Fr, 18, 19 Fr, 20 and 23. The sum of \$100 is requested for each claim as work fulfilled by the reported survey.

PROPERTY AND OWNERSHIP

	<u>Record No.</u>	<u>Tag No.</u>
Dell No. 10 M.C.	10062	212824
Dell No. 13 M.C.	10101	212827
Dell No. 14 M.C.	10102	212828
Dell No. 15 M.C.	10103	212829
Dell No. 16 Fr M.C.	10104	212830
Dell No. 17 Fr M.C.	10105	212831
Dell No. 18 M.C.	10106	212832
Dell No. 19 Fr M.C.	10063	212833
Dell No. 20 M.C.	10464	212841
Dell No. 23 M.C.	10467	212843

All of these claims are owned 100% by Cominco. They are recorded in Omineca Mining Division.

LOCATION AND ACCESS

All of these claims lie northerly and northwesterly from the Swannell Group which straddles the Swannell River as shown on Plate IN-5. The coordinates of Transmitter station 1 are latitude 56° 38' north and longitude 125° 10' west. The area is some three miles south of Delkluz Lake. A jeep trail leads from the top of the Swannell River benches to Delkluz Lake. This trail some 6 - 8 feet wide was used by a two-wheeled rubber-tired farm tractor equipped with box trailer in transporting supplies between Ingenika Mine camp and the Swannell River camp.

The Ingenika Mine area may be reached by river boats embarking at either Tudyah or McLeod Lakes on the Hart Highway and following a route via Parsnip, Finlay and Ingenika Rivers. An alternate mode of travel and transport is by charter float-equipped aircraft from either Prince George or Fort St. James. Delkluz Lake is 220 air miles north of Prince George.

INTRODUCTION

The only outcrops exposed in this area are on the immediate banks of Swannell River. The Swannell mineral showings occur mainly in thin limestone beds interbedded with graphitic slates and phyllites.

These formations comprise a tightly folded minor syncline with its axial plane trending N 30° W and dipping 70° N E. Rocks to the east of the showings are calcareous slates and phyllites striking north-westerly with gentle to moderate northeasterly dips.

A highly graphitic shear zone occurs at the western edge of the graphitic rocks. This is designated as No. 3 vein on plate IN-5.

#### SURVEY PERSONNEL

This survey was performed under the general supervision of R. G. McEachern (Professional Engineer - British Columbia) Assistant to the Chief Geologist. A. C. Taplin, graduate geologist (M.A. - U.B.C.) was in direct charge of the survey. Three student assistants were employed under close supervision, as chain and compassmen, line-cutters and as transmitter operators.

#### TYPE OF EQUIPMENT

A large coil type of McPhar electromagnetic clinometer was used for the survey. The essential equipment consists of a portable motor generator and transformer supplying high frequency (1,000 c.p.s.) alternating current, a vertical transmitting coil, and a horizontal receiving coil equipped with amplifier and earphones.

#### PRINCIPLES OF OPERATION

A current is induced in suitable buried conductors by the transmitting coil. The field produced in such a conductor has components that are both in and out of phase with the primary field due to the transmitting coil. The horizontal receiving coil balances the in phase secondary field against the primary field. This balance occurs when a "null" is evident in the earphones, i.e. when the in phase secondary field is not transecting the horizontal receiver coil to produce an audible note. Graphite and massive sulphide bodies provide the best conductors. Sphalerite without other associated sulphides is a poor conductor. The McPhar apparatus is not sensitive to disseminated sulphides or to common bedrock formations.

#### FIELD PROCEDURE

The transmitting coil is suspended in a vertical plane which can be rotated to coincide with the various bearings to the receiver coil as readings are taken along predetermined grid lines. Readings are obtained by tilting the receiving coil in a vertical plane normal to the bearing between it and the transmitter. A clinometer attached to the receiver permits measurement of dip angles. The angles recorded are those where the "null" occurs.

If the position or trend of a conducting body is known from geological information, a base line is laid out along this bearing and readings taken along cross lines spaced at intervals of 400 feet. This spacing may be decreased to 200 or 100 feet if it is desired to outline an indicated conductor in detail. Similarly, the distances between preliminary readings on the cross lines is often 100 feet, but may be increased to 200 feet or decreased to 50 feet depending on the

type of coverage required.

Readings are recorded as the degrees of tilt and the direction (right or left), as well as sharpness of the null point and intensity of the signal. By convention left readings are considered as positive and right readings as negative. By plotting profiles of each traverse made from the one location of the transmitting coil, the presence or absence of conductors can be indicated. Variations of three or more degrees are generally considered as indicating a conductor and the shape of the profile can be used to give some indications of depth, dip and width. Linear trend is determined from successive profiles.

In an area where nothing is known of the attitude or possible location of sub-surface conductors a preliminary coverage is normally made on a grid pattern. Additional grid lines are laid out to test conductors indicated by the preliminary survey. The most satisfactory results are obtained when the conductor is directly over the conductor. An effective range of 2,000 feet on either side of the transmitter is possible. Dip readings measured on traverses across a base line trending 180° relative to the previous base line will be measured with opposite directions of dip which are transposed on plotting.

Under ideal conditions the receiver coil operator is in view of the transmitter operator and the transmitting coil can be oriented by direct sighting. This is not generally the case and the transmitting is oriented for successive locations of the receiving coil by means of an orienting device. Traverses are conducted by maintaining a rigid time schedule kept by both operators, unless communication can be established between them during coverage of the closer grid lines.

#### SURVEY OF SWANNELL GROUP AND ADJACENT DELL MINERAL CLAIMS

The preliminary base line was laid out along the trend of No. 1 vein of the Swannell mineral showings. The graphitic rocks proved to be better conductors than the sulphide mineralized zone, and a conductor was only indicated along the trend of No. 3 vein, a strongly graphitic shear zone. No. 1 Base line was laid out to trace this trend as far as 5,600 feet to the northwest. The region is heavily forested with spruce, poplar and locally immature pine and alder. Base lines were slashed, chained and picketed, while cross lines were blazed and chained with each station identified on conveniently located trees. Two of the cross lines from No. 1 Base line were run with incorrect bearings and were replaced by lines on either side. By accurately correcting for slope distances, it was possible to maintain a high degree of accuracy in the chained distances. Three days were spent on the Swannell Group ground. Extension of the survey to cover Dell Nos. 20, 23 mineral claims was commenced immediately following the staking of these claims on July 3, 1956.

No. 2 Base line was laid out along the same bearing as No. 1. Once possible conductors were indicated, the transmitter was set up directly over their inferred location. Intermediate grid lines were laid out and traversed to define the conductors more accurately. Approximately 1 1/2 days were spent on ground east of Dell No. 18 and No. 19 Fr.

#### SURVEY RESULTS

The preliminary survey on the Swannell Group indicated a conductor along the graphitic shear zone comprising No. 3 vein. En echelon sub-parallel conductors are indicated further to the northwest. From 800 N to 1600 N on No. 1 Base line, the conductor may be the continuation of that definitely along the graphitic shear, with the en echelon nature due mainly to a more effective transmitter set-up, i.e. more directly over the conductor axis.

Survey of No. 2 Base line grid indicated an essentially continuous conductor for some 4,000 feet. Again locally the conductor appears to be offset between respective transmitter stations. A strong zone is indicated for this 4,000 feet distance. Since this weakens and dies out prior to reaching outcrop along the river canyon it cannot be related to any known geological structure. The 1,000 scale map reveals a marked parallelism to local drainage.

A "cross-over" indicating a strong conductor was outlined to the northwest from 5,000 N - 5,600 N. Further detailed surveys will be required to define it accurately.

EXPENDITURES

Direct field costs of the survey crew only are considered. The students were hired on the basis of a monthly wage plus board and lodging in the field. Our cost per man day is therefore shown as salary plus cost of board and lodging, plus the cost of transportation for personnel and supplies, plus the cost of personnel services. The latter includes provisions for medical coverage, holiday pay, overhead, et cetera. A breakdown on cost/man day exclusive of salaries is as follows:

Board	\$ 4.87
Lodging	1.30
Transportation	6.00
Personnel Services	<u>1.85</u>
Total	\$ 14.02 per man/day

The survey of the Swannell Group claims and adjacent Dell mineral claims was conducted from June 26 - July 31 inclusive. With a six-day working week, the total number of working days is 30. Six days is deducted for surveys on ground outside of the claims for which assessment credits are requested.

Details on the crew and total cost for each man are as follows:

	<u>Daily Wage</u>	<u>Board and Expense</u>	<u>Total</u>
R. F. Snowball - student assistant (two previous seasons' experience with McPhar E.M. surveys).	\$ 9.50	\$ 14.02	\$ 23.52
L. S. Redivo - student assistant	8.50	14.02	22.52
D. J. Hughes - student assistant	8.50	14.02	22.52
A. C. Taplin - graduate geologist in charge	15.00	14.02	29.02

Recorded cost of the survey applicable to Dell Mineral Claims Nos. 10, 13, 14, 16 Fr, 17 Fr, 18, 19 Fr, 20 and 23 are as follows:

Snowball	24 working days	@\$23.52	-	\$ 564.48
Redivo	24 "	"	@\$22.52	- 540.48
Hughes	24 "	"	@\$22.52	- 540.48
Taplin	15 "	"	@\$29.02	- 435.30
McPhar Equipment Rental Charge	24 days	@\$12.00		
		per day	-	<u>288.00</u>
Total direct field expenditures				\$ 2,368.74

QUALIFICATIONS

This report was prepared by A. C. Taplin, geologist in charge of exploration at Ingenika Properties during the 1956 field season. During the past five years, he has spent two field seasons conducting similar electromagnetic surveys at Anyox and in the Kimberley area. The cost figures were supplied by E. H. Caldwell, Exploration Superintendent Western District, and certified by Cominco accountants. R. G. McEachern has checked the report and maps and acted in a supervisory capacity throughout the course of this work.

ATTACHMENTS

Plate IN-5, 200-scale plan of E.M. Survey  
Plate IN-3, 1,000-scale plan of E.M. Survey

Submitted by

A. C. Taplin  
A. C. Taplin  
Geologist, The C. M. & S. Co. Ltd.

Endorsed by

R. G. McEachern F.E.N.G.  
R. G. McEachern  
Ass't. to the Chief Geologist,  
The C. M. & S. Co. Ltd.

ACT:gmc  
Western District Exploration Office  
December 5, 1956

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Mines Division (2)  
Western Exploration Office (2)

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

ELECTROMAGNETIC SURVEY OF DELL MINERAL CLAIMS NOS. 10, 13,  
14, 15, 16 Fr, 17 Fr, 18, 19 Fr, 20 AND 23

EXPENDITURE STATEMENT  
(PERIOD - 24 DAYS) (Jan. 1 - Oct. 31, 1956)

The Ingenika Camp was constructed and operated to accommodate general roll employees, geological staff employees and engineering staff employees for the purpose of geological mapping, geophysical surveying, geochemical soil sampling, trenching and constructing trails on the Ingenika, Indian, Dell, Gen and Swannell claims. To arrive at a reasonable and accurate expenditure for each of the above types of work, the following expenditure categories were used and computed as a cost per man-day:

- |  |   |
|--|---|
| (1) <u>Board</u>   | ) Unit cost is obtained by dividing each total cost by the number of man-days spent on the property by all personnel. |
| (2) <u>Lodging or Camp Construction and Maintenance</u>  |   |
| (3) <u>Transportation for personnel, supplies and equipment to and from the nearest supply base at Prince George</u>   |   |
| (4) <u>Overhead</u> - includes purchasing, personnel and accounting services   | ) Unit cost obtained by dividing total overhead by total man-days employed.   |
| (5) <u>Payroll Loading</u> - includes charges for vacation, medical plans, pension plans, unemployment insurance, etc. | ) Unit cost obtained by dividing total geological payroll loading by total geological man-days employed.              |

Unit Cost Calculations (Excluding Salaries)

	<u>Total Cost</u>	<u>Man-Days</u>	<u>Cost/man-day</u>
Board	\$ 4,251.70	872	\$ 4.87
Lodging	1,133.05	872	1.30
Transportation	5,229.90	872	6.00
Overhead	1,000.68	974	1.03
Payroll Loading	520.94	637	0.82
	<u>\$ 12,136.27</u>		<u>\$ 14.02</u>

Direct Cost of Geophysical Survey (24 days)

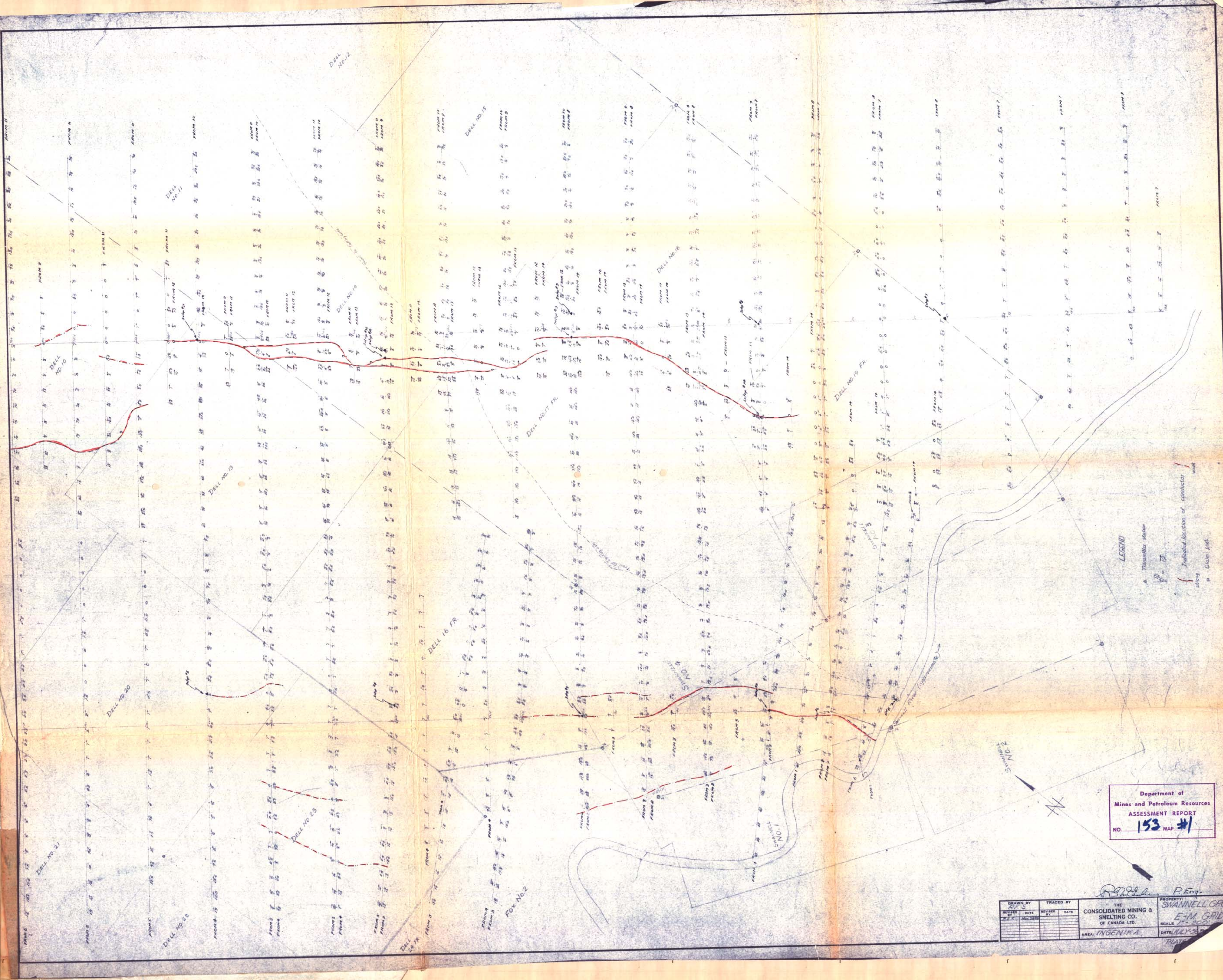
Salaries

R. F. Snowball	- 24 days at \$ 9.50/day	- \$ 228.00	
L. S. Redivo	- 24 " " 8.50/day	- 204.00	
D. J. Hughes	- 24 " " 8.50/day	- 204.00	
A. C. Taplin	- 15 " " 15.00/day	- 225.00	861.00
Board	- 87 man-days @ \$4.87/man-day		423.69
Lodging	- " " " @ \$1.30/ " "		113.10
Transportation	- " " " @ \$6.00/ " "		522.00
Overhead	- " " " @ \$1.03/ " "		89.61
Payroll Loading	- " " " @ \$0.82/ " "		71.34
McPhar Equipment Rental	- 24 days @ \$12.00/day		<u>288.00</u>
<b>Total Direct Field Expenditures</b>			<b>\$ 2,368.74</b>

CERTIFIED BY: Wes Hamsan  
Branch Accountant

E. H. Caldwell  
E. H. Caldwell  
Western District Exploration  
Superintendent





LEGEND

- A Transmitter station
- Indicated location of conductor
- Claim post

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 153 MAP #1

DRAWN BY R.F.S.	TRACED BY	DATE	DATE
REVISION	DATE	REVISION	DATE

PROPERTY OF  
THE  
CONSOLIDATED MINING &  
SMELTING CO.  
OF CANADA LTD.  
AREA: INGENIKA  
SCALE: 1" = 200'  
DATE: JULY 1953  
PLATE

R.F.S. P. Eng.